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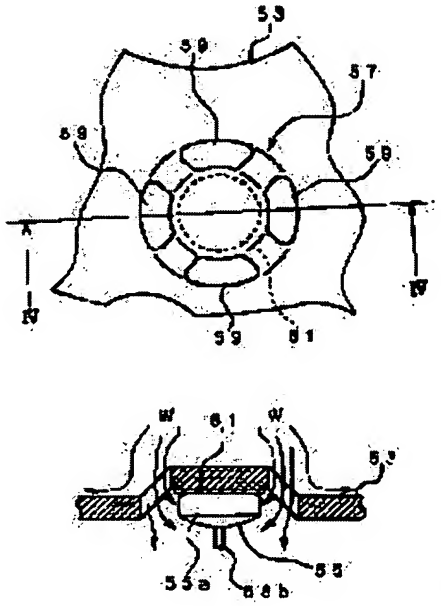
(54) AC GENERATOR FOR VEHICLE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an AC generator, for a vehicle, in which the cooling efficiency of a rectifying device can be enhanced by directly cooling a rectifying element.

SOLUTION: An embossed part 57 which is formed on every heat sink 53 of a rectifier as a rectifying device has a conical trapezoid shape, and four through holes 59 which are used as ventilation ports are formed in parts of a slope as a side face. A rectifying element 55 is attached to a flat face in a recess on the backside of the embossed part 57 so as to sandwich a copper plate 61. Since each of the four through holes 59 is formed so as to pass a part of the slope at the embossed part 57, a part of a cooling wind W which is introduced via an intake window in a rear cover flows to the backside of the heat sink 53 through the through holes 59, and a part flows along the surface of the heat sink 53. The rectifying element 55 is cooled directly by the cooling wind W which flows to the backside of the heat sink 53.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the AC generator for cars which raised the cooling effectiveness of the rectifier built in especially about the AC generator for cars carried in the automobile etc.
[0002]
[Description of the Prior Art] In order that the AC generator for cars may provide the power of ignition in an engine, lighting, and other various electronic autoparts and may maintain or raise commercial-scene competitive strength while it performs the supplementary current of a dc-battery during car transit, the formation of small lightweight, a high increase in power, and a cost cut are important technical problems. In these technical problems, the technique of changing into aluminum from copper the quality of the material of the heat sink of the rectifier built in the AC generator for cars is known as one of the means which attains the formation of small lightweight, and a cost cut. However, if a heat sink is changed into aluminum from copper, maintaining the conventional configuration since the heat transfer coefficient is small while electric resistance is larger than copper, aluminum has a possibility that it may be accompanied by the temperature rise, and needs to reduce the temperature of a heat sink by a certain approach.
[0003] Moreover, although the electric load trend of a car is in the inclination of an increment with upgrading of a car etc. every year and the high increase in power of the AC generator for cars is demanded in recent years, since increase of the output current leads to the temperature rise of a rectifier as it is, even if it is the case where it forms not only when a heat sink is formed with aluminum, but with copper, it needs to reduce the temperature of a heat sink.
[0004] There is a rectifier indicated by JP,1-99460,A as a conventional technique of reducing the temperature of the heat sink of a rectifier. Therefore, this rectifier cools directly the lead projected on the heat sink background in the style of cooling by having carried out opening and preparing the lifting section in the lead side of a rectifying device at a part of heat sink. Moreover, there is a rectifier indicated by the Germany patent No. 2942693 as other conventional techniques. This rectifier earns the surface area by bending the periphery part of a sector heat sink in the direction of a revolving shaft, and introduces a cooling wind into a rectifying-device side by preparing notching in those several corners. Moreover, there is a rectifier indicated by U.S. Pat. No. 4701828 as other conventional techniques. This rectifier is pressing this started field against the rectifying device while starting a part of heat sink along with the periphery of a rectifying device, and it introduces a cooling wind through the through tube produced by starting a heat sink partially.
[0005]
[Problem(s) to be Solved by the Invention] By the way, although the rectifier indicated by JP,1-99460,A mentioned above cools the lead of a rectifying device directly, since the surface area of the lead [itself] is small, it has a possibility that cooling effectiveness may not increase so much. Moreover, although it cut near the rectifying device and the lifting section is prepare, when rotating the fan of the AC generator for cars show in Fig. 2 of this official report, making the interior of a bracket into negative pressure and introducing a cooling wind into the background of a rectifier, since most of the cooling style flows in the direction of a revolving shaft, a possibility that cooling effectiveness may not increase without a cooling wind fully hitting is in a lead.

[0006] Moreover, there is a possibility that the rectifying device with which temperature becomes high most since it is only arranged at spacing with two or more suitable notching so that this drawing 1 and drawing 3 may show, although a cooling wind can be introduced into the background of a heat sink by several notching by which the rectifier indicated by the Germany patent No. 2942693 mentioned above was formed in the periphery corner of a heat sink cannot be cooled efficiently.
[0007] Moreover, in the style of cooling, therefore, since the rectifier indicated by U.S. Pat. No. 4701828 has cooled the started field which was introduced through the through tube which started the heat sink and was able to do it first, when cooling a rectifying device with the highest temperature directly, it has a possibility that cooling effectiveness may fall.
[0008] This invention is created in view of such a point, and the purpose is in offering the AC generator for cars which can raise the cooling effectiveness of a rectifier by cooling a rectifying device directly.
[0009]
[Means for Solving the Problem] This invention forms 1 or two or more through tubes in the location in which the rectifying device of the heat sink of a rectifier is attached so that the periphery of a rectifying device may be touched mostly, and since the part of the cooling style inhaled towards the rectifier from the inhalation aperture of the AC generator for cars hits directly the body of a rectifying device attached in the background of a heat sink by soldering etc., it can cool efficiently the rectifying device which is a source of generation of heat.
[0010] When the heights of a truncated-cone configuration which attach a rectifying device in a heat sink especially are prepared and a through tube is formed in the inclination location of the side face, in order that a through tube and the body of a rectifying device may approach, it becomes easy to hit the part of the cooling style to the body of a rectifying device directly.
[0011] Moreover, a metal plate is made to intervene between a heat sink and a rectifying device, and you may make it make a through tube face this metal plate in various kinds of rectifiers mentioned above. For example, when the quality of the material of a heat sink is made into aluminum, the case where attach a copper plate in the front face of this heat sink, and a rectifying device is further soldered to that front face can be considered, but if it is made to make a through tube face the plate of this copper, since the plate of the copper near [heat sink] the rectifying device which is a heat source will be cooled, temperature reduction of the whole rectifier is attained. In addition, also when the metal plate which mentioned above the quality of the material of a heat sink as copper is made to intervene, there is same effectiveness.
[0012] Moreover, the flow of the cooling style which flows to a heat sink and a perpendicular direction mostly can be partially turned to the body of a rectifying device by making the side which is the rim of this through tube and it not only forms a through tube, but is separated from a rectifying device incline so that a rectifying device may be approached towards the lower stream of a river of the cooling style which passes along a through tube. Or the airflow of the cooling style which flows to a rectifying-device side can be made to increase by forming the screen section of a convex configuration in the side which is the periphery of a through tube and is separated from a rectifying device, and expanding opening area to it. The body of a rectifying device which serves as an elevated temperature by these compared with a heat sink can be cooled efficiently.
[0013]
[Embodiment of the Invention] The AC generator for cars of this invention (a "AC dynamo" is called henceforth) has the description in having raised the cooling engine performance by devising the configuration of the rectifier which is a rectifier. Hereafter, the AC dynamo of the operation gestalt of 1 which applied this invention is explained concretely, referring to a drawing.
[0014] Drawing 1 is the fragmentary sectional view showing the whole AC-dynamo structure of this operation gestalt, and the structure of the AC dynamo which contains a cooling fan as an example is shown. AC dynamo 1 shown in this drawing is constituted including Rota 2, a stator 3, brush equipment 4, a rectifier 5, I.C. regulator 6, the drive frame 7, the rear frame 8, and the pulley 9 grade.

[0015] Rota 2 is the rotator of AC dynamo 1 which is a synchronous generator, and has cylindrical and the structure between which each put the rotor coil 21 concentrically rolled about from both sides through the shaft 24 which is a revolving shaft by the field cores 22 and 23 which have six

pawls for the copper wire by which insulating processing was carried out. Moreover, in order to breathe out the cooling wind absorbed from the front-side in shaft orientations and the direction of a path, the axial flow-type cooling fan 25 is being attached and fixed to the end face of the field core 22 of a front-side (pulley 9 side) by welding etc. Similarly, in order to breathe out the cooling wind absorbed from the rear-side in the direction of a path, the cooling fan 26 of a centrifugal type is being attached and fixed to the end face of the field core 23 of a rear-side by welding etc. Moreover, the slip rings 27 and 28 connected electrically are formed in the both ends of a rotor coil 21 at the rear-side of a shaft 24, and an exciting current flows from a rectifier 5 to a rotor coil 21 by attaching, where the brushes 41 and 42 in brush equipment 4 are pressed against each of the slip rings 27 and 28.

[0016] A stator 3 is the stator of AC dynamo 1, and the stator coil 32 of a three phase circuit is wound about around the slot [two or more (for example, 36 pieces)] formed in the stator core 31 at the predetermined spacing.

[0017] A rectifier 5 is for rectifying the three-phase-circuit alternating current which is the output voltage of the stator coil 32 of a three phase circuit, and obtaining a dc output, and is constituted including the terminal block 51 which contains the electrode for wiring inside, the positive-electrode side heat sink 52 fixed at the predetermined spacing and the negative-electrode side heat sink 53, and two or more rectifying devices 54 and 55 attached in each heat sink by soldering. About the detail of a rectifier 5, it mentions later.

[0018] I.C. regulator 6 is keeping the output voltage of AC dynamo 1 constant by being intermittent in the impression of an electrical potential difference to a rotor coil 21, when the exciting current passed to a rotor coil 21 is controlled, it is light and a load becomes [output voltage] high. a thing for a pulley 9 to tell rotation of an engine (not shown) to Rota 2 in AC dynamo 1 -- it is -- a shaft 24 -- on the other hand, it is bound tight and fixed to the edge (slip ring 27 grade and opposite side) with the nut 91. Moreover, the rear cover 92 is attached so that brush equipment 4, a rectifier 5, and I.C. regulator 6 may be covered.

[0019] If the rotation from an engine is told to a pulley 9 through a belt etc., Rota 2 will rotate AC dynamo 1 which has the structure mentioned above in the predetermined direction. By impressing energizing voltage to a rotor coil 21 from the exterior, each claw part of field cores 22 and 23 is excited, a stator coil 32 can be made to generate three-phase-circuit alternating voltage, and the predetermined output current is taken out from the output terminal of a rectifier 5. Henceforth, since the output voltage of AC-dynamo 1 self is impressed to a rotor coil 21 through I.C. regulator 6, the energizing voltage impressed from the outside becomes unnecessary.

[0020] Moreover, since the cooling fan 25 attached in the end face of a field core 22 rotates with rotation of Rota 2 mentioned above, while a cooling wind is inhaled to the AC-dynamo 1 interior through an about nine pulley [of the drive frame 7] inhalation aperture and a rotor coil 21 is cooled by this shaft-orientations component of the cooling style, the pulley side one half of a stator coil 32 is cooled by the direction component of a path. Since similarly the cooling fan 26 attached in the end face of a field core 23 also rotates, after the cooling wind inhaled through the inhalation aperture of a rear cover 92 cools a rectifier 5 or I.C. regulator 6, even about 26 cooling fan is led, this cooling wind is discharged in the direction of a path, and the rear-side one half of a stator coil 32 is cooled.

[0021] Drawing 2 is the top view showing the detail configuration of the rectifier 5 mentioned above. Moreover, drawing 3 is the partial expanded sectional view of AC dynamo 1 containing a rectifier 5, and the rear cover 92 and about five rectifier cross-section structure shown in drawing 1 R> 1 is shown. As shown in these drawings, a rectifier 5 has the positive-electrode side heat sink 52 which has the radii configuration where it lapped in the direction of a path partially mutually, and the negative-electrode side heat sink 53 while having predetermined spacing in the direction of a revolving shaft. The outer diameter of the positive-electrode side heat sink 52 is set up more greatly than the outer diameter of the negative-electrode side heat sink 53, and it is led to the direct positive-electrode side heat sink 52, without minding the negative-electrode side heat sink 53 while being led to the positive-electrode side heat sink 52 after a part of air introduced through the inhalation aperture of a rear cover 92 passes along the negative-electrode side heat sink 53. Moreover, the output terminal 69 taken out outside attaches the output of AC dynamo 1 in a part of positive-electrode side heat sink 52 by press fit etc., and it is fixed to it.

[0022] The positive-electrode side heat sink 52 has the four embossing sections 56 by which the rectifying device 54 was soldered to the crevice. Similarly, the negative-electrode side heat sink 53 has the four embossing sections 57 by which a rectifying device 55 is soldered to the crevice on a background. For example, while each [these] heat sinks 52 and 53 are formed in a predetermined appearance configuration by pressing the aluminum plate which has predetermined board thickness, each embossing sections 56 and 57 are formed by extruding the part. In addition, although the number of the embossing sections 56 and 57 formed in each of heat sinks 52 and 53 was made into four pieces, in rectifying the three-phase-circuit alternating current generated with the stator coil 32, as long as there are three rectifying devices 54 and 55, respectively, it may come out enough and, for a certain reason, the number of the embossing sections 56 and 57 may be set as three pieces, respectively.

[0023] Drawing 4 is drawing in which extracting any one of the embossing sections 57, and showing the detail configuration. This drawing (A) is a top view of the embossing section 57, and this drawing (B) is the IV-IV line sectional view. In addition, the embossing section 56 shall also have the same detail configuration, shall represent it, and shall explain the embossing section 57.

[0024] The embossing section 57 is formed as heights of a truncated-cone configuration, and four through tubes 59 used as a vent hole are formed in the inclination location which is the side face. Each through tube 59 is formed by piercing with press equipment, in case the embossing section 57 is extruded. Or a through tube 59 may be formed by cutting.

[0025] Moreover, the rectifying device 55 is attached in the flat side of the background crevice of the embossing section 57 on both sides of the copper plate 61 which is a metal plate. Generally, since it is not easy for the heat sink 53 which is an aluminum plate, with this operation gestalt, soldering case 55a of the rectifying device 55 whose quality of the material is copper attached the copper plate 61 in heat sink 53 front face by ultrasonic welding etc., and it has soldered case 55a of a rectifying device 55 to it on the front face further. Thus, while a rectifying device 55 and a heat sink 53 contact good electrically by soldering a rectifying device 55 to the background crevice flat side of the embossing section 57 on both sides of the copper plate 61, the heat generated with the rectifying device 55 comes to get across to a heat sink 53 efficiently through the copper plate 61.

[0026] Moreover, since each of four through tubes 59 is formed so that a part of inclined plane of the embossing section 57 may be penetrated as mentioned above, as W of the cooling style introduced through the inhalation aperture of a rear cover 92 is shown in drawing 3 and drawing 4 (B), a part flows on the background of a heat sink 53 through a through tube 59, and a part flows along the front face of a heat sink 53. Therefore, while heat sink 53 self is cooled by W of the cooling style which flows along the front face of a heat sink 53, a rectifying device 55 is directly cooled by W of the cooling style which flows on a background.

[0027] Generally case 55a and lead 55b of a rectifying device 55 are formed with copper with small electric resistance, and since thermal conductivity is also large, if these can be cooled directly, they can cool efficiently the rectifying device 55 which is one of the heat sources. Since case 55a and a through tube 59 serve as physical relationship which approached very much when the outer-diameter dimension of the background crevice flat side of the embossing section 57 and the outer-diameter dimension of case 55a of a rectifying device 55 are set as the almost same magnitude, as especially shown in drawing 4 (B), case 55a which becomes an elevated temperature by W of the cooling style introduced through the through tube 59 can be cooled efficiently.

[0028] Moreover, although it may paint to a rectifier 5 for the purpose of corrosion prevention, since two or more through tubes 58 and 59 are formed in each embossing sections 56 and 57, paint comes to be easy of the rectifier 5 of this operation gestalt the surroundings on the background (side in which rectifying devices 54 and 55 are attached) of each heat sinks 52 and 53 of a rectifier 5, and it can prevent generating of paint unevenness. Powder coating is compared with liquid paint if it is going to perform powder coating to the conventional rectifier especially. Since the fluidity is low, As shown in drawing 4 , when a rectifying device 55 is soldered to embossing section 57 background on both sides of the copper plate 61 Although it is not easy to make the fine particles for paint fully permeate to the clearance part near the periphery of the copper plate 61, if a through tube 59 is formed near the periphery of the copper plate 61 like this operation gestalt, since fine particles will surroundings-lump-come to be easy into this part, generating of paint unevenness can be suppressed.

[0029] Moreover, the rectifier 5 has the complicated configuration and muddy water, storm sewage, etc. tended to pile up in the surroundings of the background of each heat sinks 52 and 53, especially rectifying devices 54 and 55 conventionally so that the cross-section structure of the rectifier 5 shown in drawing 3 may show, but with this operation gestalt, since through tubes 58 and 59 are formed in the location near rectifying devices 54 and 55, it is effective in preventing stagnation of such various liquid.

[0030] Drawing 5 is drawing showing the modification of the operation gestalt mentioned above. This drawing (A) is a top view which extracted any one of the embossing sections 57, and this drawing (B) is the V-V line sectional view. The points replaced with the copper plate 62 which changed the configuration of the copper plate 61 partially compared with the about 57 embossing section structure shown in drawing 4 differ. That is, the copper plate 61 shown in drawing 4 has the circular configuration which has the almost same outer diameter as case 55a of a rectifying device 55, and it is used in order to make soldering of a rectifying device 55 easy. On the other hand, the copper plate 62 shown in drawing 5 can raise cooling effectiveness further by projecting this extension to the ventilation flue of W of the cooling style while it has the configuration where the outer-diameter part corresponding to a through tube 59 was extended outside and makes soldering of a rectifying device 55 easy. This copper plate 62 is more slightly [than the background crevice flat side of the embossing section 57] small, and it still more specifically has larger circular partial 62a for junction a little than the base of case 55a of a rectifying device 55, and four arm 62b by which is beginning to be prolonged on all sides from this part for junction, and direct **** is carried out at a through tube 59. And these arm 62b is located on the direction of an axis of a through tube 59 so that direct viewing can be carried out through a through tube 59.

[0031] Since the direction of the copper plate 62 near the rectifying device 55 which is a heat source becomes an elevated temperature from a heat sink 53 especially, a temperature gradient with W of the cooling style becomes large, and heat release also becomes large. Moreover, since it can project to a through tube 59 only by extending the outer-diameter part of the copper plate 62 as shown in drawing 5 (B), the cooling effectiveness of the copper plate 62 can be raised, and when transposing the copper plate 61 to the copper plate 62 moreover, the rise of a manufacturing cost can be suppressed to the minimum that what is necessary is just to change the punching type of configuration.

[0032] Drawing 6 is drawing showing the modification of a through tube prepared in the inclined plane of the embossing section, and the case where a part of pierced heat sink 53 is used as a guide plate which introduces W of the cooling style is shown by the example mentioned above. This drawing (A) is a top view which extracted any one of the embossing sections 57, and this drawing (B) is the VI-VI line sectional view. By making the edge of the through tube 59 of the side which is separated from a rectifying device 55 incline so that a rectifying device 55 may be approached towards the lower stream of a river of the flow of W of the cooling style which passes along this through tube 59 as shown in this drawing (B), this inclination part is used as a guide plate 65 of W of the cooling style, and the flow of W of the cooling style which passes along a through tube 59 can be positively turned to case 55a and lead 55b of a rectifying device 55. Although a part of heat sink 53 was removed by punching, cutting, etc. especially with the structure shown in drawing 4 in order to form a through tube 59 The guide plate 65 is formed by bending along with one side by the side of the periphery of a through tube 59, and making the background (side which attaches a rectifying device 55) of a heat sink 53 incline without removing a part of this heat sink 53 with the structure shown in drawing 6 . Efficient cooling of a rectifying device 55 is realizable with a deployment of an ingredient.

[0033] Drawing 7 is drawing which deformed further the configuration of the embossing section circumference shown in drawing 6 , any one flat-surface configuration of the embossing section 57 is shown in this drawing (A), and the VII-VII line cross section is shown in this drawing (B). Although the point of making it functioning as a guide plate 65 which bends a part of heat sink 53, and introduces W of the cooling style is the same as the structure of the embossing section 57 shown in drawing 6 , extrusion molding by the press is performed on the periphery of the through tube 59 of the side which is further separated from a rectifying device 55, and the screen section 63 of a convex configuration in alignment with the periphery of a radii configuration is formed. For example, the

screen section 63 carries out press deformation of a part of heat sink 53 by the side of a periphery further by extrusion molding by the press, and is formed in a convex configuration by producing thick change. A part of W of the cooling style which flows on the front face of a heat sink 53 by this screen section 63 is incorporated in a through tube 59, and the opening area for introducing W of the cooling style into a rectifying-device 55 side can be expanded substantially.

[0034] Drawing 8 is drawing showing other modifications to which the opening area which introduces W of the cooling style is expanded, any one flat-surface configuration of the embossing section 57 is shown in this drawing (A), and the VIII-VIII line cross section is shown in this drawing (B). Although the guide plate 65 was formed with the structure shown in drawing 6 by making the edge of the through tube 59 of the side which is only separated from a rectifying device 55 incline It is the edge of the through tube 59 of the side which performed end bending by the press with the structure shown in drawing 8 , and is separated from a rectifying device 55. By starting outside the connection section 67 formed in the location where the inclined plane and heat sink 53 of the embossing section 57 cross, the path of a periphery part forms the big guide plate 66. Moreover, the rectifying-device 55 side of the guide plate 66 which is the inside [section / 67 / connection] inclines so that a rectifying device 55 may be approached like the guide plate 65 shown in drawing 6 towards the lower stream of a river of the flow of W of the cooling style which passes along a through tube 59. Therefore, the flow of W of the cooling style which passes along a through tube 59 can be positively turned to case 55a and lead 55b of a rectifying device 55, and the opening area for introducing W of the cooling style into a rectifying-device 55 side can be substantially expanded by moreover enlarging the path of the periphery.

[0035] Since the airflow of W of the cooling style led to case 55a on on the background 55 of the embossing section 57, i.e., a rectifying device, and lead 55b by expanding the opening area for introducing W of the cooling style according to the structure shown in drawing 7 or drawing 8 increases, the rectifying device 55 which serves as an elevated temperature from a heat sink 53 can be cooled efficiently.

[0036] In addition, this invention is not limited to the above-mentioned operation gestalt, and deformation implementation various by within the limits of the summary of this invention is possible for it. For example, although the quality of the material used the heat sinks 52 and 53 of aluminum, you may make it, as for the rectifier 5 mentioned above, the quality of the material use a copper heat sink. However, the copper plate 61 shown in drawing 4 etc. in this case is unnecessary, and can solder a rectifying device to the flat part on an embossing section background directly. Moreover, what is necessary is just to change the number and the configuration of this through tube 59 suitably, taking the temperature of a rectifying device, the quality of the material of a heat sink, etc. into consideration, although the case where four through tubes 59 were formed in each of each embossing section 57 as an example was explained.

[0037] Moreover, since the plate equivalent to a through tube 59 will be pierced and removed when carrying out press working of sheet metal of the plate of aluminum or copper and forming the heat sink 53 shown in drawing 4 , by producing thick change from this part to pierce towards the remaining inclined planes, as the thickness of the remaining inclined planes is increased, to a heat sink 53, heat is propagation-easy and may carry out from a rectifying device 55. Since malleability and ductility are good when the quality of the material is especially made into aluminum, thick change can be produced easily and there is also an advantage of being easy to carry out processing mentioned above.

[0038] Moreover, you may make it form a cooling fin by extruding partially the remaining inclined planes whose thickness mentioned above increased. Drawing 9 is drawing showing about 57 embossing section [in which the cooling fin 64 was formed to the inclined plane] structure, this drawing (A) shows a top view and this drawing (B) shows the IX-IX line sectional view, respectively. Since the surface area of a heat sink 53 increases using the thickness which moved to the inclined plane which adjoins in case a through tube 59 is formed by forming a cooling fin 64 towards a heat sink 53 from the edge of the heights flat side of the embossing section 57 as shown in these drawings, cooling effectiveness can be raised further. Since the cooling wind which flows from this heights flat side to a rectifying device 55 through the cooling wind and through tube which flow on the front face of a heat sink 53 is not interrupted when a cooling fin 64 is mostly formed in a

radial from the core of the heights flat side of the embossing section 57 as especially shown in drawing 9 (A), the airflow of the cooling style does not fall.
[0039] Moreover, in order to make soldering easy a premise [forming heat sink 53 grade using the plate of aluminum] in explanation of the operation gestalt mentioned above Although the copper plate 61 is attached in the crevice flat side of the embossing section 57 of a heat sink 53 and the rectifying device 55 was further soldered to the front face When the rectifying device 55 was attached to the heat sink 53 direct picking by the approach of direct soldering or others, or when a heat sink 53 is formed with copper, this copper plate 61 may be removed. Or the heat dissipation version 53 is formed with copper, and you may make it add the copper plate 62.
[0040] Moreover, although the four embossing sections 56 and 57 are formed in each of heat sinks 52 and 53 and rectifying devices 54 and 55 were attached in the crevice by soldering etc. in explanation of the operation gestalt mentioned above, it is also applicable to the rectifier which has a heat sink without the embossing sections 56 and 57, i.e., the rectifier which the direct or copper plate was made to be placed between heat sinks without irregularity, and attached the rectifying device. In this case, instead of forming the through tube used as a vent hole in the inclined plane of the embossing section, 1 or two or more through tubes are formed so that the case periphery of a rectifying device may be touched mostly. Thus, since the cooling wind which flows on the background of a rectifier through this through tube by forming a through tube in a rectifying device and a very near location will flow in accordance with the case of a rectifying device, the rectifying device used as an elevated temperature can be cooled directly. Moreover, since some copper plates 62 are exposed to this through tube when the copper plate 62 of the configuration shown in drawing 5 is used, this copper plate 62 can be cooled efficiently. As shown in drawing 6 - drawing 8 , when it bends a part of heat sink or a screen is formed, the sense of the cooling style which passes along a through tube can be changed, and it can hit to a rectifying device still more directly, or opening area can be expanded, and the increment in airflow can be aimed at.
[0041] Moreover, although the operation gestalt mentioned above illustrated and explained AC dynamo 1 of an inner fan type with which the cooling fan was built in in the frame as shown in drawing 1 , this invention is applicable also about the AC dynamo of the outside fan type which attached the cooling fan in the pulley end face.

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CLAIMS

[Claim(s)]
[Claim 1] The AC generator for cars which is one field of the heat sink attached almost perpendicularly to the flow of the cooling style introduced through an inhalation aperture, and said heat sink, and is characterized by to prepare 1 or two or more through tubes in the AC generator for cars with which the rectifier containing the rectifying device attached in said inhalation aperture and opposite side was built in so that it may be the location in which the rectifying device of said heat sink is attached and the periphery of said rectifying device may be touched mostly.
[Claim 2] The AC generator for cars characterized by forming the heights of a truncated-cone configuration so that it may project in claim 1 in the location in which the rectifying device of said heat sink is attached at said inhalation aperture side, and preparing said through tube in the inclination location of this heights side face.
[Claim 3] The AC generator for cars characterized by having made the metal plate intervene between said heat sinks and said rectifying devices, having made said through tube face this metal plate, and having arranged it in claims 1 or 2.
[Claim 4] The AC generator for cars characterized by turning to said rectifying device said flow of the cooling style which passes said through tube by making it incline so that the edge of said through tube of the side which is separated from said rectifying device may be turned to the lower stream of a river of said flow of the cooling style in claims 1 or 2 and said rectifying device may be approached.
[Claim 5] The AC generator for cars characterized by making large opening area of the cooling style which flows to said rectifying-device side by forming the screen section of a convex configuration in the periphery of said through tube of the side which is separated from said rectifying device in claim 4.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the fragmentary sectional view of the AC dynamo which applied this invention.
[Drawing 2] It is the top view showing the detail configuration of the rectifier which is a rectifier.
[Drawing 3] It is the partial expanded sectional view of the AC dynamo near the rectifier.
[Drawing 4] It is drawing showing the detail structure of the embossing section formed in the rectifier.
[Drawing 5] It is drawing showing the modification of the embossing section formed in the rectifier.
[Drawing 6] It is drawing showing other modifications of the embossing section formed in the rectifier.
[Drawing 7] It is drawing showing other modifications of the embossing section formed in the rectifier.
[Drawing 8] It is drawing showing other modifications of the embossing section formed in the rectifier.
[Drawing 9] It is drawing showing other modifications of the embossing section formed in the rectifier.
[Description of Notations]
1 AC Dynamo
2 Rota
3 Stator
4 Brush Equipment
5 Rectifier
51 Terminal Block
52 53 Heat sink
54 55 Rectifying device
56 57 Embossing section
58 59 Through tube
61 62 Copper plate

[Translation done.]

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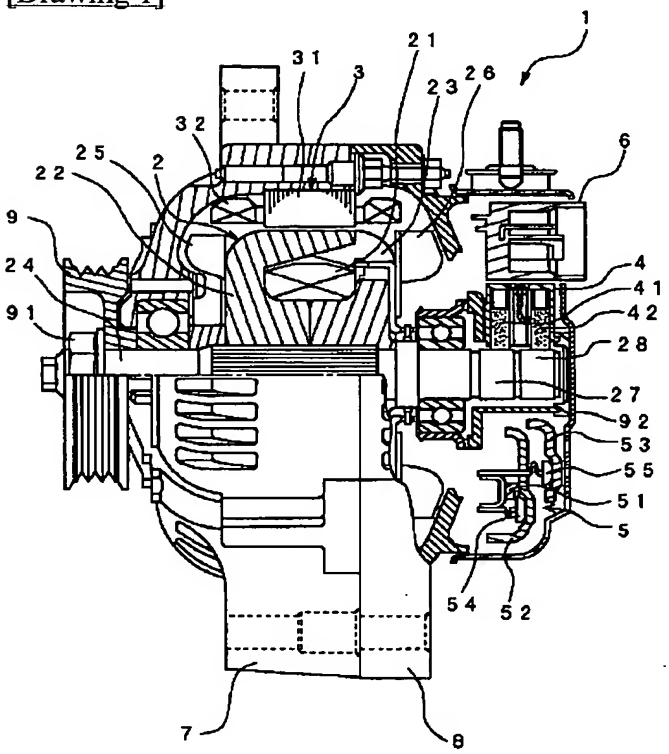
damages caused by the use of this translation.

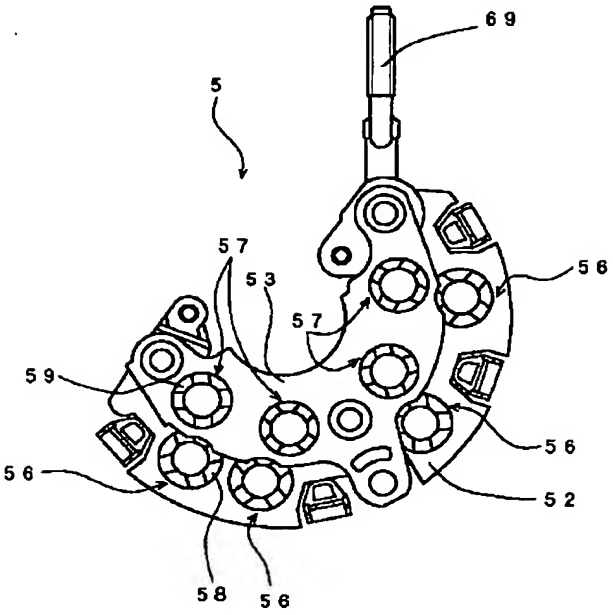
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

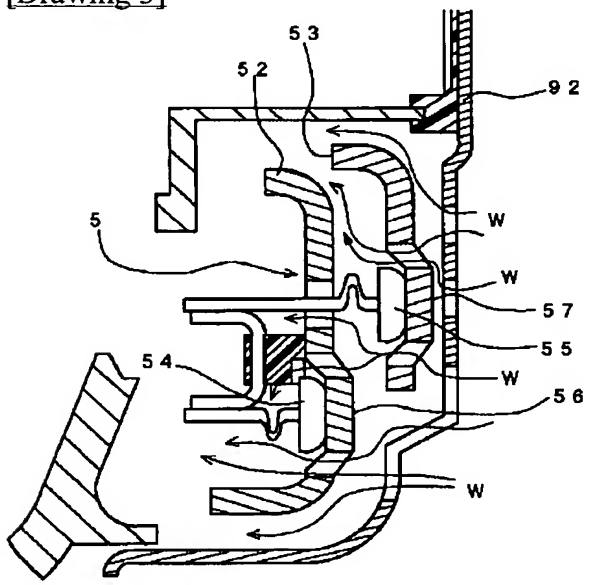
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Drawing 4]

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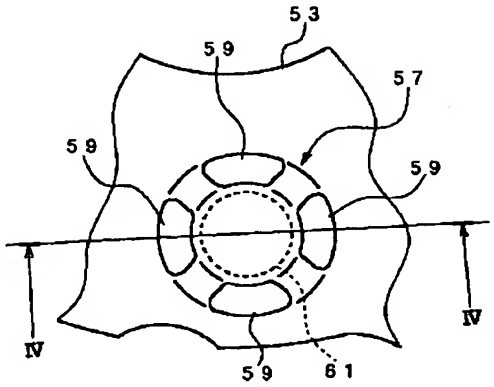

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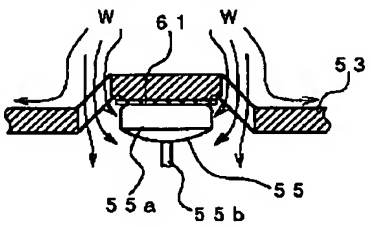

[Drawing 5]

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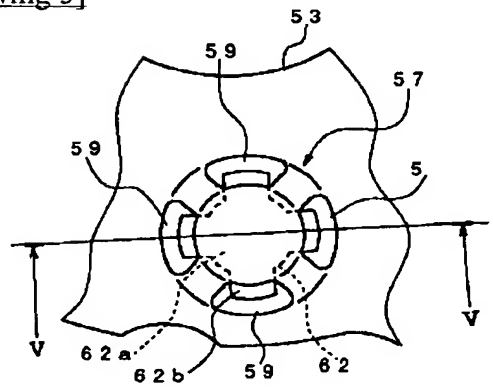

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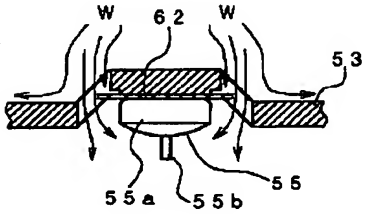

[Drawing 6]

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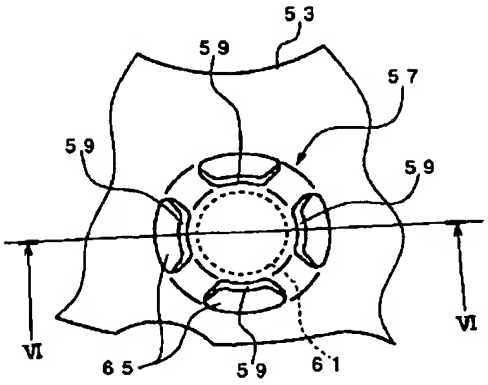

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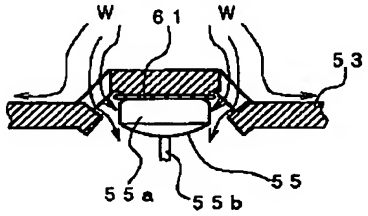
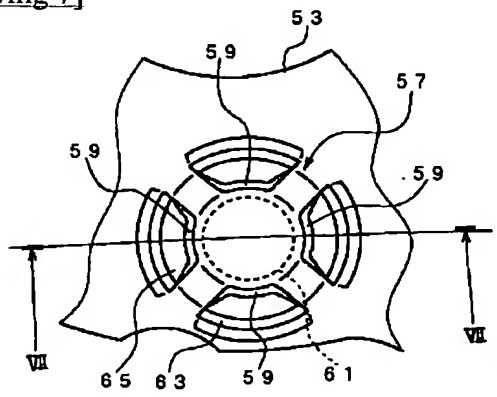


[Drawing 7]

(A)



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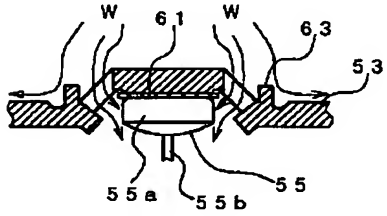
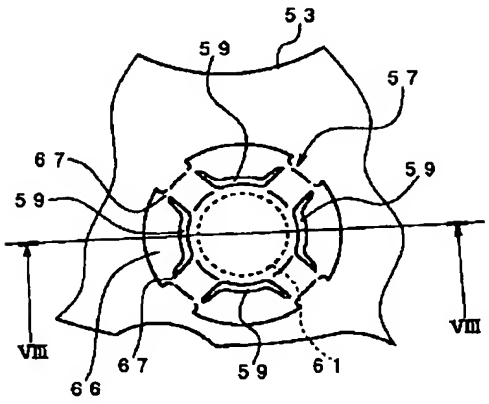


[Drawing 8]

(A)



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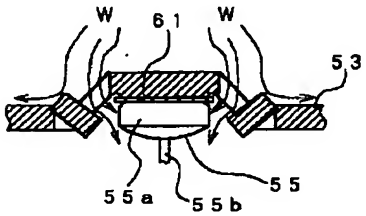
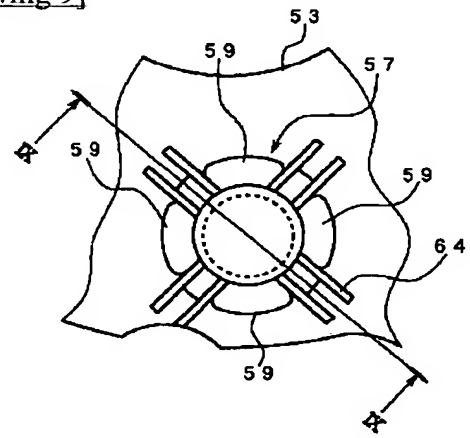


[Drawing 9]

(A)



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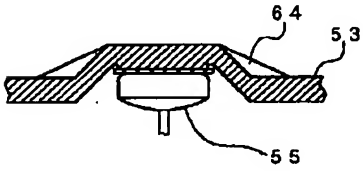

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